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EXAMINER
FLORES, LEON

ART UNIT	PAPER NUMBER
2611	

NOTIFICATION DATE	DELIVERY MODE
08/02/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ip.department.us@nxp.com

Office Action Summary

Application No.

10/502,282

Applicant(s)

GIGI, ERCAN FERIT

Examiner

Leon Flores

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 9 and 10 is/are rejected.
- 7) ☒ Claim(s) 4-8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 June 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims (1-10) have been considered but are moot in view of the new ground(s) of rejection.

Response to Remarks

Applicant asserts that, "the Examiner has not presented correspondence for the limitations directed toward a summation".

The examiner respectfully disagrees. In the first office action the examiner cited "Principles of Communication systems", by Herbert Taub, where an equation for describing quantization error is derived by using a probability function times the integral of the original signal minus the quantized signal squared. One skilled in the art would know that integral is just another term for summation. Furthermore, the combination of Nishio and Kim inherently teaches this summation. In Nishio, the method of reducing the quantization noise from PCM signals is achieved, not only for one sample, but for many samples. However, taking the contrary, the examiner has issue a new ground of rejection to substantiate for this limitation.

The applicant asserts that, "the Examiner's use official notice is plainly erroneous".

The examiner respectfully disagrees. In the first office action the examiner cited "Principles of Communication systems", by Herbert Taub, where an equation for describing quantization error is derived. The examiner has attached a copy of the pages deriving such equation.

The applicant asserts that, "there is no motivation to combine the cited equation ($e = (S^2/12)^{1/2}$) with the Nishio reference in that the Combination would render Nishio unfit for its intended operation".

The examiner respectfully disagrees. The motivation for combining these references was established in the first office action mailed 11/30/06. Both the cited equation and the reference of Nishio are clearly in the same field of endeavor. They both teach a method for reducing quantization error from PCM signals.

The applicant asserts that, "the asserted combination of the Kim reference's windowing of video signals (.e.g., into M x N sized images) with Nishio's audio signals would "also result in an indiscernible/inoperable embodiment".

The examiner respectfully disagrees. Both of these references pertains to reducing quantization noise from digital signals. However, taking the contrary, the examiner has issue a new ground of rejection to substantiate for this matter.

The applicant asserts that, "the Examiner has not presented a rejection for claims 2-7 and 9-10. As such, Applicant respectfully submits that these claims should be identified as allowable".

The examiner respectfully disagrees. A rejection for claim 9 was presented in the first office action. However, claims 2-7 and 10 have been examined in this office action.

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Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims (1 & 9) are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishio et al. (US Patent 5,774,842), and in view of Kim (US Patent 5,636,295) for the same reasons as set forth in the last office action.

Claim Objections

2. Claims (1-10) are objected to because of the following informalities: In claims 1 & 9, the limitation "substracting" should be rewritten as "subtracting".

Appropriate correction is required.

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Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims (1-3, 9-10) are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishio et al. (hereinafter Nishio)(US Patent 5,774,842), and in view of Yutaka Goto (hereinafter Yutaka), "Effects of Noise on the Interpolation Accuracy for Apodized FFT Spectra of Time-Domain Damped signals", Department of Information Science and Electronics, Tsukuba College of Technology, Tsukuba-shi, Ibaraki, 305 Japan, Volume 49, Number 12, 1995.

Re Claim 1, Nishio discloses a method for subtracting quantization noise from a pulse code modulated PCM signal being segmented into frames (See Fig. 8 & 14 & Abstract), comprising the steps of: calculating for each frame of said PCM signal a constant quantization noise level Bq (See Fig. 8: the input of unit 13) subtracting the

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quantization noise as represented by said quantization noise level B_q from said PCM signal. (See Fig. 8 & col. 4, lines 66-67).

Nishio fails to disclose the following equation: $B_q = \frac{1}{W} \sum_{n=0}^{W-1} \{ (s_{\min}^*[n] - s_{\max}^*[n]) w[n] \}^2$ wherein n : indicates a specific sample of the PCM signal; $S^*_{\text{sub.min}}[n]$: represents the minimum quantization noise level for a specific sample value $s^*[n]$ of said PCM signal; $S^*_{\text{sub.max}}[n]$: presents the maximum quantization noise level for the specific sample value $s^*[n]$ of the PCM signal; $w[n]$: represents a window-function; and W : represents the number of samples per window.

However, Yutaka does. (See whole document, and specially section "Theory" equations 8-11) Yutaka discloses several equations describing Frequency-Domain S/N ratio due to quantization and windowing. Equation 9 describes the power spectrum of noise, which is comprised of the standard deviation and some windowing function. On the other hand, equation 11 describes the quantization error, in which Yutaka further recites that "In digital processing of sampled analog signals, the quantization error is commonly viewed as an additive noise signal. With the use of the relation the squared root of the quantization error is equal to the standard deviation. If we substitute this relationship into equation 9 we yield that the power spectrum of noise is equal to the quantization error times some windowing function. And this is exactly the formula the applicant is claiming in both claims 1 and 9.

Therefore, taking the combined teachings of Nishio and Yutaka as a whole. It would have been obvious to one of ordinary skill in the art to have incorporated this feature into the system of Nishio, in the manner as claimed, and as taught by Yutaka,

for the benefit of determining the power spectrum of noise as a function of the quantization noise and some windowing function.

Re claim 2, the combination of Nishio and Yutaka further discloses that characterized in that the minimum quantization level $S^*.sub.min$ as well as the maximum quantization level $S^*.sub.max$ are known. (In Yutaka, see equation 11.)

Re claim 3, the combination of Nishio and Yutaka further discloses that characterized in that the minimum quantization level $S^*.sub.min$ and the maximum quantization level $S^*.sub.max$ are predicted according to the following equations:
$$S^*.sub.min = i[n] - (i[n] - i.sub.min[n]) / 2$$
$$S^*.sub.max = i[n] + (i.sub.max[n] - i[n]) / 2$$
 wherein i : represents one out of a plurality of possible representation levels predefined due to the specific PCM quantization method applied to an original signal; $i[n]$: represents that predefined representation level which corresponds to the sample value $s^*[n]$ for a specific n ; $i.sub.min[n]$: represents that representation level which is--startet from $i[n]$ --the next smaller non-zero representation level for which $u[n]=1$; $i.sub.max[n]$: represents that representation level which is--startet from $i[n]$ --the next bigger non-zero representation level for which $u[n]=1$; with the usage array $u[i]$ being defined to:
$$u(i) = \min(1, n = 0 \text{ to } L - 1 \{ 0, s^*[n] \geq 1, \text{ otherwise } \}, -2^{N-1} \leq i < 2^{N-1})$$
 wherein L : represents the number samples of the whole PCM-signal; and N : represents the number of bits used for quantizing an original sample value by using PCM to generate

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the PCM sample values $s^*[n]$. (In Yutaka, see section "Theory". Furthermore, one skilled in the art would know how to obtain these equations.)

Re claim 9, this claim is a system claim comprising elements that would have necessitated the corresponding method steps of claim 1. Therefore, this claim has been analyzed and rejected in view of claim 1.

Re claim 10, the combination of Nishio and Yutaka further disclose that characterized in that it is located at a decoder's side. (In Nishio, see fig. 16: element 53 & col. 12, lines 24-30)

Allowable Subject Matter

5. Claims (4-8) are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Re claim 4, the further limitation of, *"the method according to claim 1, characterized in that the subtracting of the quantization noise represented by said quantization noise level B_q from the PCM-signal is carried out in the frequency domain according to the following steps: computing the spectrum $S^*[k]$ of the PCM signal $s^*[n]$ and forming the magnitude $|S^*[k]|$ thereof; computing a signal-to-noise ratio $SNR[k]$ of said spectrum $S^*[k]$ according to: $SNR[k] = |S^*[k]| / B_q$; calculating from said signal-to-noise ratio $SNR[k]$ a filter magnitude $F[k]$ according to a predefined filter algorithm based on at least one filter update parameter; calculating an*

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output spectrum $S_{sup.b}[k]$ at least substantially free of said quantization noise by multiplying both the real part $R\{S^[k]\}$ and the imaginary part $I\{S^*[k]\}$ of the spectrum $S^*[k]$ with said filter magnitude $F[k]$; and transforming the output spectrum $S_{sup.b}[k]$ back into a signal $s_{sup.b}[n]$ in the time domain". Claims 5-8 depend on claim 4 above.*


Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leon Flores whose telephone number is 571-270-1201. The examiner can normally be reached on Mon-Fri 7-5pm Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LF
July 16, 2007


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SUPERVISORY PATENT EXAMINER